

Bergman, B.P., Mackay, D.F., Smith, D.J. and Pell, J.P. (2017) Suicide in Scottish military veterans: a 30-year retrospective cohort study. *Occupational Medicine*, 67(5), pp. 350-355. (doi: [10.1093/occmed/kqx047](https://doi.org/10.1093/occmed/kqx047))

This is the author's final accepted version.

There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

<http://eprints.gla.ac.uk/140988/>

Deposited on: 12 May 2017

## **Suicide in Scottish military veterans: a 30-year retrospective cohort study**

### **Authors:**

Beverly P Bergman  
Daniel F Mackay  
Daniel J Smith  
Jill P Pell

Dr BP Bergman PhD  
Institute of Health and Wellbeing, University of Glasgow, Glasgow G12 8RZ, UK  
Beverly.bergman@glasgow.ac.uk

Dr DF Mackay PhD  
Institute of Health and Wellbeing, University of Glasgow, Glasgow G12 8RZ, UK  
Daniel.mackay@glasgow.ac.uk

Prof DJ Smith MD  
Institute of Health and Wellbeing, University of Glasgow, Glasgow G12 8RZ UK  
Daniel.Smith@glasgow.ac.uk

Prof JP Pell MD  
Institute of Health and Wellbeing, University of Glasgow, Glasgow G12 8RZ, UK  
Jill.pell@glasgow.ac.uk

### **Corresponding Author:**

Dr BP Bergman PhD  
Institute of Health and Wellbeing  
Public Health & Health Policy  
1 Lilybank Gardens  
Glasgow  
G12 8RZ

Telephone: (++)44 141 330 6482  
Fax: Nil  
E-mail: [Beverly.bergman@glasgow.ac.uk](mailto:Beverly.bergman@glasgow.ac.uk)

## ABSTRACT

**Background:** Although reassuring data on suicide risk in UK veterans of the 1982 Falklands conflict and 1991 Gulf conflict have been published, there have been few studies on long-term overall suicide risk in UK veterans.

**Aims:** To examine the risk of suicide in a broad population-based cohort of veterans in Scotland, irrespective of length of service or exposure to conflict, in comparison with people having no record of military service.

**Methods:** A retrospective 30-year cohort study of 56,205 veterans born 1945-1985, and 172,741 matched non-veterans, using Cox proportional hazard models to compare the risk of suicide and fatal self-harm overall, by sex, birth cohort, length of service and year of recruitment.

**Results:** There were 267 (0.48%) suicides in the veterans compared with 918 (0.53%) in non-veterans. The difference was not statistically significant overall (adjusted hazard ratio 0.99, 95% CI 0.86-1.13). The incidence was lower in younger veterans and higher in veterans aged over 40. Early service leavers were at non-significantly increased risk (adjusted HR 1.13, 95% CI 0.91-1.40) but only in the older age-groups. Women veterans had a significantly higher risk of suicide than non-veteran women (adjusted HR 2.44, 95% CI 1.32-4.51,  $P < 0.01$ ) and comparable risk to veteran men. Methods of suicide did not differ significantly between veterans and non-veterans, for either sex.

**Conclusions:** The Scottish Veterans Health Study adds to the emerging body of evidence that there is no overall difference in long-term risk of suicide between veterans and non-veterans in the UK. However female veterans merit further study.

**Key words:** Military veterans; suicide; early service leavers; retrospective cohort studies; women; suicide methods

## INTRODUCTION

Despite the recent publication of a number of high quality studies on suicide in veterans, there remains no clear consensus as to their risk.[1] Kaplan reported a doubling of risk in US male veterans compared with non-veterans, using data from the 1986-1994 National Health Interview Survey (NHIS),[2] although Miller et al. re-examined the same dataset and found only a modest non-significant increase in risk.[3] LeardMann found no increase in risk associated with military-specific variables in the US military Millennium Cohort Study population followed up from 2001 to 2008.[4] A 2008 US government report noted the lack of consensus but found that the majority of studies reported no increase in risk in comparison with age, gender and ethnically-matched non-veterans.[3] More recently, Hoffmire et al. reported an elevated risk in US veterans in 2000, SMR 1.19, increasing to SMR 1.63 by 2010. Women veterans were at particularly high risk, SMR 5.89. The pattern of risk was not uniform across veterans' groups.[5] In the UK, Kapur et al. examined suicides in a retrospective cohort of 233,803 veterans who left the armed forces between 1996 and 2005 and found that the overall rate of suicide was no higher than in the general population, but there was an increased risk in those aged under 25 years. For veterans aged 30-49 years, the age-specific rates were lower than in the general population. [6] UK veterans of the 1982 Falklands conflict showed an overall reduction in risk of suicide/open verdict deaths compared with the general population (SMR 65, 95% CI 53-80), similar to the risk of suicide reported in UK military personnel followed up since the 1991 Gulf conflict (SMR 76, 95% CI 66-88).[7, 8]

The Scottish Veterans Health Study includes veterans drawn from a broad range of backgrounds and aims to examine the long-term impact of military service on health,

through comparison with health outcomes in people who have never served, in order to improve the understanding of UK veterans' health and contribute to the evidence base for provision of veterans' health and welfare services. We compared the long-term risk of suicide in veterans and non-veterans in order to explore whether there were differences, overall or by subgroup.

## **METHODS**

The Scottish Veterans Health Study is a retrospective cohort study of all 56,570 military veterans in Scotland who were born between 1945 and 1985, who were resident in Scotland and were registered with the National Health Service (NHS) Scotland both before and after service, and a comparison group of 172,753 individuals with no record of service ('non-veterans'), matched 3:1 for age, sex and postcode sector of residence (mean population 5,000). We used Scottish linked health records (which cover all individuals registered with NHS Scotland) and mortality data to compare long-term health outcomes in veterans and non-veterans. The study cohort and methods have been described in detail previously.[9] Baseline demographic data, including veteran status and dates of entering and leaving military service for veterans, were provided by NHS electronic registration records. These data were linked at an individual level to routine acute hospital and mental healthcare data (Scottish Morbidity Record SMR01 and SMR04) and death certificates to provide information on suicide and fatal self-harm. The maximum period of follow-up was from 1 January 1981 to 31 December 2012; veterans were followed up from the point of leaving military service if later than 1 January 1981. Demographic data on the composition of the military population were obtained from published UK government statistics.[10] The data

extract was pseudo-anonymised and approval for the study was granted by the Privacy Advisory Committee of the Information Services Division of NHS Scotland.

Socio-economic status (SES) was derived from the most recent registered postcode of residence, using the Scottish Index of Multiple Deprivation (SIMD), in quintiles ranging from 1 (most deprived) to 5 (least deprived). SIMD is calculated on a regional basis, in data zones having a mean population of 800, and is based on income, employment, health, education (including skills and training), housing, crime and access to services.[11]

‘Suicide and fatal self-harm’ was defined as cause of death recorded as ICD10 codes X60-X84, Y87.0, Y10-Y34 or Y87.2, or ICD9 codes E950-E959 or E980-E959. These codes encompassed death resulting from suicide, intentional self-harm or events of undetermined intent. For conciseness the term ‘suicide’ is used in this paper to encompass all such events whether legally determined to be suicide or not. We categorised the method of suicide as ‘non-violent’ if resulting from poisoning by solids, liquids or gases, and ‘violent’ if due to hanging, strangulation, suffocation, drowning, falling or jumping from a height, firearms or explosives, cutting, or contact with a moving object. ‘Early Service Leavers’ (ESL) were defined as veterans who had left with 2.5 years’ service or less. Although shorter than the current 4-year minimum, this ensured that veterans who completed the earlier minimum of three years’ service were not incorrectly classified as ESL.[12] Veterans having 0.4 years’ service (20 weeks) or less were categorised as not having completed initial training. Cox proportional hazard models were used to examine the association between veteran status and cumulative risk of suicide, using age as the time-dependent variable, age at death from suicide as the failure time, and age at death (if no suicide) as the censor time. Cox

proportionality assumptions were tested using methodology based on Schoenfeld residuals.[13] The log-likelihood test was used to test for interactions between veteran status, risk of suicide, and both sex and birth cohort separately. The *a priori* rejection level was set at 0.05. The models were run univariately and then repeated adjusting for SES. The analyses were repeated stratifying by grouped year of birth to examine potential birth cohort effects. Incidence was calculated as suicides per 100,000 person-years, based on time of follow-up from entry to the study, to death or censoring. Method of suicide was compared for veterans and non-veterans, by gender. All analyses were performed using Stata® v12.1.

## RESULTS

After data cleansing to remove incomplete or invalid records, 56,205 (99.3%) veterans and 172,741 (99.9%) non-veterans were included in the analysis. There were 50,970 (90.7%) male veterans and 5,235 (9.3%) female, reflecting the gender balance of the armed forces. The mean period of follow-up was 29.3 years, and there was a total of 6.7 million person years of follow-up among veterans and non-veterans combined. Over the period of follow-up, 267 (0.48%) veterans died from suicide compared to 918 (0.53%) non-veterans, equating to 7.6% of all deaths in veterans and 8.4% of deaths in non-veterans. The difference in overall risk was not statistically significant (HR 1.03, 95% CI 0.90-1.18) and remained non-significant after adjusting for deprivation (HR 0.99, 95% CI 0.86-1.13) (Table 1).

Of the 11 deaths among veterans aged under 25, 2 (18%) were due to suicide. This compared with 39 (24%) of the 163 deaths in non-veterans under 25. The difference did not reach statistical significance (HR 0.43, 95% CI 0.06-3.17) either in the univariate model



or after adjustment for SES (HR 0.47, 95% CI 0.06-3.45). The Nelson-Aalen cumulative hazard plot showed a lower risk in veterans at younger ages, catching up with the risk in non-veterans in older age (Figure 1). Testing for non-proportionality of the hazards was non-significant. Subdistribution hazard ratios (SHR) to show the impact of competing risks (death from causes other than suicide) demonstrated that there was no difference in risk in the unadjusted model, SHR 1.05, 95% CI 0.92-1.21, but after adjusting for deprivation, the risk was significantly lower in veterans, SHR 0.74, 95% CI 0.71-0.77,  $P<0.001$ .

Rates of suicide per 100,000 person-years of follow-up confirmed that veterans aged under 40 were not at increased risk compared with non-veterans, but there was a modest increase in the oldest age-groups. The overall rate for male and female veterans together was 21.2 per 100,000 person-years, compared with 17.0 for non-veterans, while for those under 40, it was 14.3 for veterans compared with 13.9 for non-veterans. The overall suicide rate in ESL veterans was intermediate between that of non-veterans and veterans, but when analysed by age group, their rate was lower than both veterans and non-veterans in all but the oldest age group (50 and over) (Table 2).

There was a significant interaction between birth cohort, veteran status and risk of suicide ( $P<0.01$ ), but subgroup analysis by 5-year birth cohorts showed that the significantly increased risk was confined to the 1950-1954 cohort (adjusted HR 1.44, 95% CI 1.06-1.97,  $P<0.05$ ) (Table 1 and Figure 2). Crude incidence of suicide by year of entry to service showed no evidence of association with periods of intense military operational activity. There was a non-significant increase in risk among the ESL subgroup (unadjusted HR 1.23,

95% CI 1.00-1.52) which was attenuated after adjusting for SES (HR 1.13, 95% CI 0.91-1.40) (Table 1).

There was a significant interaction between sex, veteran status and risk of suicide ( $P < 0.01$ ). Whilst there was no significant difference between male veterans and male non-veterans (adjusted HR 0.94, 95% CI 0.81-1.08), female veterans were at significantly higher risk than female non-veterans (adjusted HR 2.44, 95% CI 1.32-4.51,  $P < 0.01$ ). Comparing women with men, non-veteran women were at much lower risk than non-veteran men (adjusted HR 0.28, 95% CI 0.19-0.40,  $P < 0.001$ ), but there was no statistically significant difference for veteran women compared with veteran men (adjusted HR 0.71, 95% CI 0.43-1.18). The mean age at death from suicide for veteran men was 44, compared with 41 for non-veterans, whilst for women it was 49 for veterans compared with 39 for non-veterans. All the veteran women who died as a result of suicide joined the armed services prior to 1991, half had left after 3 years or less and none had served for more than 11 years. Three-quarters were living in the most deprived SES quintiles.

Analysis of the method of suicide showed that for both veterans and non-veterans men were more likely to use violent means than women. For women, 25% of veterans and 33% of non-veterans used violent means. The difference was not statistically significant, OR 0.75, 95% CI 0.28-2.01. For men, 61% of veterans and 63% of non-veterans chose a violent method, a non-significant difference OR 1.02, 95% CI 0.91-1.14. The commonest method in men was hanging, strangulation or suffocation, accounting for 41% of suicides in veterans and 37% in non-veterans, a non-significant difference OR 1.09, 95% CI 0.92-1.30, whilst for women it was poisoning by drugs or chemicals, accounting for 62% of suicides in women

veterans and 60% in non-veterans. The difference in women was not statistically significant, OR 1.04, 95% CI 0.64-1.68. Veteran men were less likely than non-veteran men to use firearms or explosives, only 3 (0.8%) veterans using this method compared with 18 (2.0%) non-veterans, although the reduction in risk in veterans did not achieve statistical significance, OR 0.58, 95% CI 0.17-1.96. No veteran or non-veteran women used firearms or explosives.

## **DISCUSSION**

Our findings show that overall there was no significant difference in risk of suicide between veterans and non-veterans, but differences emerged on subgroup analysis. Only veterans in the 1950-1954 birth cohort showed a significantly increased risk compared with non-veterans, which persisted after adjusting for deprivation. Veterans born after 1960 may be at decreased risk. The difference did not reach statistical significance but the number of events in this subgroup was small. Women veterans were at increased risk compared with non-veteran women. For non-veterans, women were at lower risk than men, but among veterans, women had comparable risk to men. The method of suicide did not differ significantly between veterans and non-veterans for either men or women; veteran men were non-significantly less likely to use firearms or explosives than non-veteran men.

Comparison with national rates is problematic owing to the changing picture over the long period of the study. In the general Scottish population, the age-standardised rate for men in 2009-10 was 21.8 (95% CI 20.5-23.1) and for women it was 7.3 (95% CI 6.6-8.0),<sup>[14]</sup> compared with our finding of 21.2 for all veterans. The UK-wide rates in 2011 were 18.2 per 100,000 person-years for men and 5.6 per 100,000 person-years for women.<sup>[15]</sup> Thus the

general population rates are higher in Scotland than in the UK overall, although there has been a fall of nearly 20% in Scotland between 2000-03 and 2011-13.[16] We found the highest incidence for both veterans and non-veterans to be in the 5<sup>th</sup> decade (age 40-49). This accords with the 2010 Scottish data, although changes over time during the long follow-up period are likely. Only early service leavers showed a higher incidence of suicide in older age. This group is of particular concern as they have been shown to be at higher risk of mental health problems [12, 17] but we are not aware of any previous studies on their long-term suicide risk. In a systematic review of psychological autopsy studies, Cavanagh et al. identified mental disorders as having the strongest association with suicide, increasing with age.[18] In the absence of contextual data on individual cases, no conclusions can be drawn on precipitating factors in our study but ensuring through-life support to ESL, both male and female, would benefit this vulnerable group.

Men are at consistently higher risk of suicide than women throughout the developed world,[19] and in Scotland the ratio was 3:1 in 2009-10.[14] In our study, the rate for all veterans (of whom 90% were male) of 21.2 per 100,000 person-years was similar to the rate for men in Scotland of 21.8 per 100,000, whilst female veterans experienced a risk closer to that of male veterans, and significantly higher than non-veteran women. No previous UK studies have examined suicide in veteran women, but US studies have revealed no consensus [20,21,22] and recently Hoffmire et al. reported a greatly increased risk for female veterans, SMR 5.89 in 2010, compared with only 1.54 for male veterans.[5]

Women serving in the armed forces may exhibit increased risk-taking behaviours,[23] as do men,[24] and we suggest that this may modify their usual overall reduced risk of suicide to a

more 'male' level, although the methods chosen remained gender-specific. The choice of method of suicide varies with gender, culture and availability of method, although the reasons are poorly understood, and both the intended level of lethality and risk of damaging the body appearance have been suggested to explain the reduced likelihood of use of violent methods by women.[25] The reduced risk of suicide by firearms and explosives in veteran men in our study compared with non-veterans contrasts with serving personnel, where 20% of suicides in men result from this cause although the rate has reduced from a peak of 6 per 100,000 per year in the army in the mid-1990s to around 1 per 100,000 per year in 2012.[26] Our results differ from a US study which showed an increased risk of firearm-related suicide in both male and female veterans compared with the wider population.[27] However, unlike in the US, veterans in the UK are unlikely to have ready access to weapons owing to stringent gun-control legislation.

In our study the increased risk in women appears to be limited to those who joined prior to 1991 and therefore served in the women's corps; women who joined the armed forces from 1992 onwards served alongside men, following a change in employment policy, with no distinction as to role apart from the ongoing prohibition on women serving on the front line in a combat role. The reasons for the change in risk pattern for suicide in women veterans require further investigation.

The strengths of the present study are that it was based on a large cohort covering the whole of Scotland with up to 30 years follow-up. The ICD-coded causes of death were taken from acute and psychiatric hospital records, which are subject to regular quality assurance checks, as well as death certificates, and are therefore likely to be both accurate and

complete in respect of those events occurring within Scotland. As the recording of deaths in the UK is governed by strict legal processes, systematic misclassification of veteran deaths is unlikely. The use of record linkage to analyse individual level data directly derived from health and vital records allowed a robust cohort study design to be employed. The results were able to be matched or adjusted for potential confounders including sex and SES. It was possible to do subgroup analysis by sex, birth cohort and length of service, contributing to the understanding of suicide in veterans.

Limitations of the study include possible loss to follow-up of subjects due to migration away from Scotland, which could not be quantified, and the lack of any follow-up data prior to 1981. The number of suicides was small, limiting the power of the study especially in subgroup analysis, but as the sample covered 100% of all veterans meeting the inclusion criteria, there was no scope to increase the power. It is likely that this was a factor in the lack of significance demonstrated in some of the findings. As the dataset was derived from demographic, vital record and hospital admissions data, there was no information on individual deployments, combat exposure or personal lifestyle factors such as alcohol. Therefore, residual confounding may still have been present as we were unable either to analyse the impact of these factors or adjust for them; the likelihood of combat exposure could only be inferred from period of service. Only the last recorded postcode was available which, for veterans, was necessarily post-service. Therefore the impact of childhood deprivation could not be assessed. Veterans with reserve service only could not be identified and were included amongst the non-veterans; this would have had the effect of reducing any observed differences between veterans and non-veterans.

Our findings add to the emerging body of evidence that there is no overall difference in risk of suicide between veterans and non-veterans, and thereby provide further reassurance that military service overall does not increase risk. However the pattern in older women veterans requires further investigation. The risk faced by older veterans of both genders, especially ESL, should receive recognition.

#### **KEY POINTS:**

- Analysis of data from the Scottish Veterans Health Study demonstrates that overall, Scottish UK veterans born between 1945 and 1985 were no more likely than non-veterans to die as a result of suicide.
- Women veterans were at increased risk compared with non-veteran women, and exhibited a risk profile similar to that of veteran men, whilst early service leavers were not at significantly increased risk overall, although their risk was higher in the earlier birth cohorts.
- There was no difference in method of suicide between veterans and non-veterans, either in men or in women.

#### **Acknowledgments**

The authors thank the NHS Central Registry (NHSCR) and the Information Services Division, NHS Scotland (ISD) for extracting and linking the dataset.

## REFERENCES

1. Miller M, Barber C, Azrael D, Calle EE et al. Suicide Among US Veterans: A Prospective Study of 500,000 Middle-aged and Elderly Men. *Am J Epidemiol* 2009;**170(4)**:494-500.
2. Kaplan MS, Huguet N, McFarland BH et al. Suicide among male veterans: a prospective population-based study. *J Epidemiol Community Health* 2006;**61(7)**:619-24.
3. Miller M, Barber C, Young M, Azrael D, Mukamal K, Lawler E. Veterans and Suicide: A Reexamination of the National Death Index–Linked National Health Interview Survey. *Am J Public Health*. 2012;102(S1):S154-S9.
4. LeardMann CA, Powell TM, Smith TC. Risk factors associated with suicide in current and former US military personnel. *JAMA* 2013;**310(5)**:496-506.
5. Hoffmire CA, Kemp JE, Bossarte RM. Changes in suicide mortality for veterans and nonveterans by gender and history of VHA service use, 2000–2010. *Psychiatr Serv*. 2015.
6. Kapur N, While D, Blatchley N et al.. Suicide after leaving the UK Armed Forces - a cohort study. *PLoS Med* 2008;**6(3)**:1-9.
7. Defence Statistics (Health). A study of deaths among UK Armed Forces personnel deployed to the 1982 Falklands Campaign: 1982 to 2012. Abbey Wood: 2013.
8. Defence Statistics (Health). 1990/1991 Gulf Conflict - UK Veterans Mortality Data: Causes of Death. Abbey Wood: 2014.
9. Bergman BP, Mackay DF, Pell JP. Acute Myocardial Infarction in Scottish Military Veterans: A Retrospective Cohort Study of 57,000 Veterans and 173,000 Matched Nonveterans. *Am J Epidemiol* 2014;**179(12)**:1434-41.
10. Ministry of Defence (2013) United Kingdom Defence Statistics 2012, London: Ministry of Defence.
11. Scottish Government. Scottish Index of Multiple Deprivation 2012. Edinburgh: Scottish Government: 2012.



12. Bergman BP, Mackay DF, Smith DJ et al.. Long-term mental health outcomes of military service: National linkage study of 57,000 veterans and 173,000 matched nonveterans. *J Clin Psychiatry* 2016;**77(6)**:793-8.
13. Grambsch PM, Therneau TM. Proportional hazards tests and diagnostics based on weighted residuals. *Biometrika* 1994;**81**:515-26.
14. ISD Scotland. The Scottish Suicide Information Database 2012. Scotland: NHS Scotland, 2012.
15. Scowcroft E. Suicide Statistics Report 2013.
16. ScotPHO Suicide Statistics Publication. ScotPHO 2014.  
<http://www.scotpho.org.uk/downloads/suicide/ScotPHO-Suicide-Statistics-Publication-2014-Archive.pdf> last accessed 5 Jan 2017.
17. Buckman JEJ, Forbes HJ, Clayton T et al. Early Service leavers: a study of the factors associated with premature separation from the UK Armed Forces and the mental health of those that leave early. *Eur J Public Health* 2013;**23(3)**:410-5.
18. Cavanagh JT, Carson AJ, Sharpe M et al. Psychological autopsy studies of suicide: a systematic review. *Psychol Med*. 2003;**33(03)**:395-405.
19. Moller-Leimkuhler AM. The gender gap in suicide and premature death or: why are men so vulnerable? *Eur Arch Psychiatry Clin Neurosci* 2003;**253(1)**:1-8.
20. Thomas TL, Kang HK, Dalager NA. Mortality among Women Vietnam Veterans, 1973–1987. *Am J Epidemiol* 1991;**134(9)**:973-80.
21. McCarthy JF, Valenstein M, Kim HM et al. Suicide Mortality Among Patients Receiving Care in the Veterans Health Administration Health System. *Am J Epidemiol* 2009;**169(8)**:1033-8.
22. Kang HK, Bullman TA. Mortality among U.S. Veterans of the Persian Gulf War. *N Engl J Med* 1996;**335(20)**:1498-504.
23. Fear NT, Iverson A, Meltzer H et al. Patterns of drinking in the UK Armed Forces. *Addiction* 2007;**102(1749)**:1759.

24. Thandi G, Sundin J, Dandeker C et al. Risk-taking behaviours among UK military reservists. *Occup Med* 2015;**65**(5):413-6.
25. Värnik A, Kolves K, van der Feltz-Cornelis CM, et al. Suicide methods in Europe: a gender-specific analysis of countries participating in the “European Alliance Against Depression”, *JECH*. 2008;**62**(6):545-551.
26. Defence Statistics (Health). Suicide and Open Verdict Deaths in the UK Regular Armed Forces 1984-2014. 2015. Abbey Wood: Ministry of Defence.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/416463/20150326\\_UK\\_AF\\_Suicide\\_National\\_Statistic\\_2015\\_Data\\_O.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/416463/20150326_UK_AF_Suicide_National_Statistic_2015_Data_O.pdf) accessed 30 Apr 2015.
27. Kaplan MS, McFarland BH, Huguet N. Firearm suicide among veterans in the general population: findings from the national violent death reporting system. *J Trauma*. 2009;**67**(3):503-507.

**Table 1.** Cox proportional hazard model of the association between veteran status and risk of suicide

		Univariate			Multivariate <sup>a</sup>		
		HR	95% CI	P value	HR	95% CI	P value
Sex	Male	0.98	0.95-1.12	NS	0.94	0.81-1.08	NS
	Female	2.52	1.36-4.66	<0.01	2.44	1.32-4.51	<0.01
Birth year <sup>e</sup>	1945-1949	1.15	0.79-1.67	NS	1.09	0.75-1.58	NS
	1950-1954	1.51	1.11-2.06	<0.01	1.44	1.06-1.97	<0.05
	1955-1959	1.05	0.78-1.41	NS	1.00	0.74-1.35	NS
	1960-1964	0.88	0.65-1.21	NS	0.87	0.64-1.19	NS
	1965 -1969	0.90	0.64-1.28	NS	0.92	0.65-1.31	NS
	1970-1974	0.81	0.48-1.36	NS	0.79	0.47-1.33	NS
	1975-1979	0.67	0.20-2.22	NS	0.67	0.20-2.22	NS
Leaver status	Basic training <sup>b</sup>	1.13	0.81-1.59	NS	1.06	0.75-1.48	NS
	ESL <sup>c</sup>	1.23	1.00-1.52	NS	1.13	0.91-1.40	NS
	Non-ESL <sup>d</sup>	0.98	0.83-1.16	NS	0.96	0.81-1.14	NS

HR hazard ratio; CI confidence interval; <sup>a</sup> adjusted for area-based deprivation quintile; <sup>b</sup> Did not complete initial training; <sup>c</sup>Did not complete minimum engagement; <sup>d</sup>Completed at least the minimum term of service; <sup>e</sup>No cases in veterans born 1980-1985

**Table 2.** Incidence of suicide per 100,000 person-years at risk by veteran status and length of service (men & women combined)

	All veterans		Veterans up to 3 years service <sup>a</sup>		Non-veterans	
	n=56,205		n=17,884		n=172,741	
Age	Number	Rate	Number	Rate	Number	Rate
Under 30 years	~	5.2	~	4.4	144	10.1
30-<40 years	73	18.2	47	17.2	286	18.4
40-<50 years	127	30.6	79	26.2	348	26.6
≥50 years	56	20.2	41	20.0	140	16.9
All ages	267	21.2	173	19.8	918	17.0

<sup>a</sup>Due to methodological differences, category boundaries for length of service differ from those in Table 1.

~ Numbers <10 suppressed

## FIGURE LEGENDS

**Figure 1.** Nelson-Aalen plot of risk of suicide in veterans and non-veterans

**Figure 2.** Unadjusted hazard ratio of suicide in veterans referent to non-veterans by birth cohort